TBMR-110M

DC - 110 MHz high speed EMI-Analyzer

Datasheet

Rev.1.2

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1 Main Features

- EMI Analyzer 1 Hz - 110 MHz (Measurement Receiver)

  - -162 dBm/Hz noise floor down to 1 kHz
  - 7-band hardware pre-selector filter bank.
  - 30 dBm maximum input power
  - CISPR-16, ANSI and MIL-STD compliant detectors
  - Peak, Quasi-Peak, Average, CISPR-Average, RMS and CISPR-RMS detectors working in parallel.
  - Sweep, STFFT and direct parallel resolution bandwidth setting (-3 dB and -6dB)
  - Numerous predefined Standards, ready to load and use
  - Pre-measurement with selective Peak measurement
  - Direct fast compliant STFFT measurement
  - Many pre-defined transducers, antenna factors and various other compensation files
  - Many data manipulation, display and documentation features
  - Direct control from EMCview or standalone operation
  - Quick load of predefined setups

- Spectrum Analyzer

  - 1 Hz - 110 MHz measurement range
  - Tracking Generator
  - 0.1 Hz to 3.5 MHz arbitrary RBW and VBW setting
  - Zero Span operation with time domain triggering
  - Linear, log amplitude and frequency display
  - Sweep, STFFT and direct parallel resolution bandwidth setting
  - Parallel RMS, Pos./Neg. peak and average detector
  - Trace Memory option, normalization
  - Equation based trace display
  - Peak hold
  - Noise marker, max and band power display
  - Quick load of predefined setups

- Tracking Analyzer 1 Hz - 110 MHz

  - Linear and logarithmic sweep
  - -50 dBm to -10 dBm adjustable TG power (0 dBm up to 100 MHz)
  - 120 dB dynamic range
  - Use of power correction file and level correction file
  - Quick load of predefined setups.

- Noise Analyzer 1 Hz - 110 MHz

  - Measurement of absolute RMS noise power or voltage spectral density
  - Noise figure measurement
  - Noise can be referenced to the input or output of devices under test

- Oscilloscope 250 MS/s, DC - 110 MHz

  - 1 ns/DIV to 1 s/DIV horizontal resolution
  - Interpolated sampling up to 4 GS/s
  - Real-time Sampling up to 250 MS/s, 14 Bit
  - Up to 16 MS sampling size
  - Various Trigger options
  - Vertical CIC Filter option for noise reduction
  - Many automatic measurement features

- Demodulator

  - Direct demodulation into the PC sound system
  - FM, AM and SSB demodulator
  - Adjustable bandwidth, center frequency and demodulator parameters
  - Automatic demodulation parameter measurements

- IQ Stream Generator

  - GNU-Radio data source.
  - Directly stream floating point I and Q data into file or network
  - Adjustable center frequency and bandwidth

- Remote Control

  - Direct remote control of the EMI Analyzer over network
  - Text based protocol
  - EMCview compatible

2 Specifications

Parameter	Description	Value/Range	Remark
Operating Voltage	Mains Voltage Range	100-120 VAC / 200 - 240 VAC, 50-60 Hz	Mains voltage selection switch
Operating Temperature		0 °C – 40 °C,	
Storage Temperature		-20 °C – 60 °C	
Frequency Range	Oscilloscope	DC - 110 MHz	True DC coupled
	Spectrum Analyzer	1 Hz - 110 MHz	Max. 0V DC
	EMI Analyzer	1 Hz - 110 MHz	Max. 0V DC
	Tracking Analyzer	1 Hz - 110 MHz	Max. 0V DC
Reference Frequency accuracy	Initial accuracy after 30 minutes warm-up	+/- 10 ppm	
RF Input connector		50 Ohm, Type-N	
RF input VSWR		< 1 : 1.15	10 … 30dB att.
		< 1 : 1.5	0 … 30dB gain
Maximum RF input level	Attenuation / gain	+30 dBm/137dBµV/7V	20dB/30dB att.
	dependent	+25 dBm/132dBµV/4V	10 dB att.
	Negative att. = gain	+15 dBm/122dBµV/1.25V	0 … -30dB att.
Input RF attenuator		0 - 30 dB in 10 dB steps	
Input LNA		0 - 30 dB in 10 dB steps	
Amplitude Accuracy	DC - 110 MHz	Better +/- 0.8 dB	at 18°C - 28°C
Noise (DANL)	f = 10 Hz	- 132 dBm typ.	RBW = 1Hz
	f = 100 Hz	- 144 dBm typ.	RBW = 1Hz
	f = 1 kHz	- 149 dBm typ.	RBW = 1Hz
	f = 10 kHz	-156 dBm typ.	RBW = 1Hz
	f = 100 kHz	- 160 dBm typ.	RBW = 1Hz
	f > 1MHz - 110 MHz	- 162 dBm typ.	RBW = 1Hz
Intercept Point 2	f = 10 MHz	+ 50 dBm typ.	ATT = 0 dB
Intercept Point 3	f_1 = 32 MHz, f2= 33 MHz	+ 43 dBm typ.	ATT = 30 dB
		+ 24 dBm typ.	ATT = 0 dB
		- 6 dBm typ.	ATT = -30 dB
Resolution Bandwidth		0.1 Hz - 3.5 MHz	arbitrary
Video Bandwidth		0.1 Hz - 3.5 MHz	arbitrary
Pre-Selector Filter Bank		7 Bands + Bypass	6th order band-pass
Sampling Rate		250 MSPS, 14 Bit	
Detector		RMS, pos./neg. Peak, Average, Quasi Peak, CISPR Average, CISPR RMS.	According to CISPR-16-1-1 and Mil Std. 461
Processing		Sweep, STFFT, parallel sweep	
Tracking Generator frequency stability		+/- 25 ppm	
Tracking Generator amplitude stability	DC - 100 MHz Level > -30 dBm	better +/- 0.5 dB	
Tracking Generator amplitude range	DC - 100 MHz 100 MHz - 110 MHz	-50 dBm to 0 dBm -50 dBm to -10 dBm	
Dimensions / weight		L x W x H: 33 x 38 x 12 cm; 5.2 kg	

Attenuation [dB]	Absolute Max. Input Level [dBm, dBµV, V]
30	**30 dBm, 137 dBuV, 7 V**
20	**30 dBm, 137 dBuV, 7 V**
10	**25 dBm, 132 dBuV, 4 V**
0	**15 dBm, 122 dBuV, 1.25 V**
-10 (equivalent 10dB gain)	**15 dBm, 122 dBuV, 1.25 V**
-20 (equivalent 20dB gain)	**15 dBm, 122 dBuV, 1.25 V**
-30 (equivalent 30dB gain)	**15 dBm, 122 dBuV, 1.25 V**

3 History

Version	Date	Application software version	Changes
V1.0	24.4.2024	V1.0	Initial document
V1.1	28.10.2024	V1.1	TG amplitude range detail
V1.2	16.1.2025	V1.4	Noise analyzer application added

The application software version refers to the most recent version available at the time of writing the datasheet.